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Fish and Wildlife Service
Mid-Columbia River Fishery Resource Office
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MEMORANDUM

August 27, 2012

To: Interested parties

From: Matt Hall

RE: Snorkel survey results for adult spring Chinook salmon and bull trout in Icicle Creek, 2012

The Mid-Columbia River Fisheries Resource Office has conducted an annual summer snorkel survey in Icicle Creek since 2003, with a primary objective of enumerating adult spring Chinook salmon and bull trout. Methods have evolved along with Icicle Creek water management, and the current survey paradigm has been in place since 2006 (Table 1). The surveyed area begins at the USGS gage on Icicle Creek and continued downstream (~rm 5.6) to the Icicle/Wenatchee River confluence.

In 2012, the survey was conducted on August 9. For all reaches the weather was sunny and water visibility was estimated at 2-3m and was “fair” for all sections of the river with the exception of turbulence/bubbles that obscured viewing in some small areas (ie. hatchery ladder, headgate, boulder pockets). The flow at the DOE gage at the Icicle Bridge was 366cfs, which is average for this time of year. All bull trout lengths indicated were visually estimated to the nearest odd centimeter. For consistency all lengths are expressed in millimeters.

Table 1. Annual Icicle Creek snorkel dates.

2006	8/3
2007	7/31
2008	8/6
2009	8/5
2010	8/12
2011	8/10
2012	8/9

All surveys were conducted in a downstream manner with snorkelers evenly spaced across the stream. The survey was broken into seven reaches. The number of adult Chinook salmon and

bull trout observed (both live and carcass) and the number of snorkelers utilized per reach are indicated in Table 2. The surveyors enumerated a total of 131 adult spring Chinook salmon and 20 bull trout in Icicle Creek (Figures 1 and 3). Of these, 51 adult spring Chinook and 3 bull trout were observed above Leavenworth NFH intake (Figures 2, 4, 5 and 6). No spring Chinook or bull trout were observed above the Boulder Falls.

Table 2. Results of the 2012 Icicle Creek snorkel survey.

<u>Reach</u>	<u>Adult Chinook</u>	<u>Bull Trout</u>	<u>Bull Trout Size Range</u>	<u># Viewers</u>
USGS gauge – IPID	0	0		3
Boulder Falls – LNFH Intake	51	3	(190mm-410mm)	3
LNFH Intake –S2	22	2	(350mm-450mm)	4
S2-S5 (Historic Channel)	41	5	(350mm-510mm)	4
LNFH Spillway Pool	5	0		4
S5 – Stump Hole	8	10	(190mm – 350mm)	4
Stump Hole – Icicle Mouth	4	0		2
Totals:	131	20	(190mm – 510mm)	
06'-11' Ave:	152	63		
06'-11' Max:	283	157		
06'-11' Min:	48	10		

Of the 20 bull trout observed, 95% were 450mm or less indicating they were juvenile/sub-adult fluvial bull trout (M. Nelson pers. comm.). This is similar to previous years, when >80% of observed bull trout were classified as juvenile/sub-adult fluvial fish.

Although enumeration of Chinook salmon and bull trout was the primary objective, some additional observations were noted. Rainbow trout were abundant in most upstream reaches (S5-USGS Gauge). Mountain whitefish and suckers were only encountered below the LNFH intake. Two dead brook trout were observed within a short distance upstream and downstream of the Boulder Falls. Few sockeye and few summer Chinook were observed.

The cool, wet spring of 2012 in the Pacific Northwest generally resulted in protracted high flow and decreased temperature throughout the Wenatchee Basin. One hypothesis regarding bull trout usage of Icicle Creek suggests that cool mainstem Wenatchee River temperatures provide good conditions for bull trout, sockeye, and summer Chinook, resulting in their absence in the “thermal refuge” of the cooler Icicle Creek. There is a positive correlation between Wenatchee River July mean 7DADmax temperatures and bull trout abundance in Icicle Creek on the day of the snorkel survey (Figure 7).

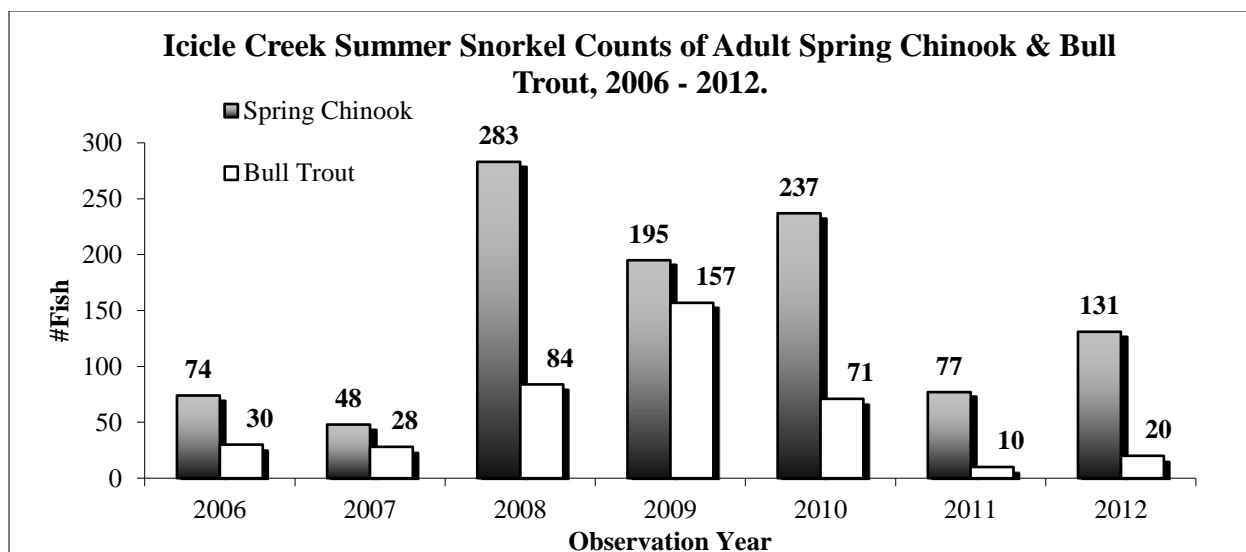


Figure 1. Icicle Creek snorkel survey counts by year.

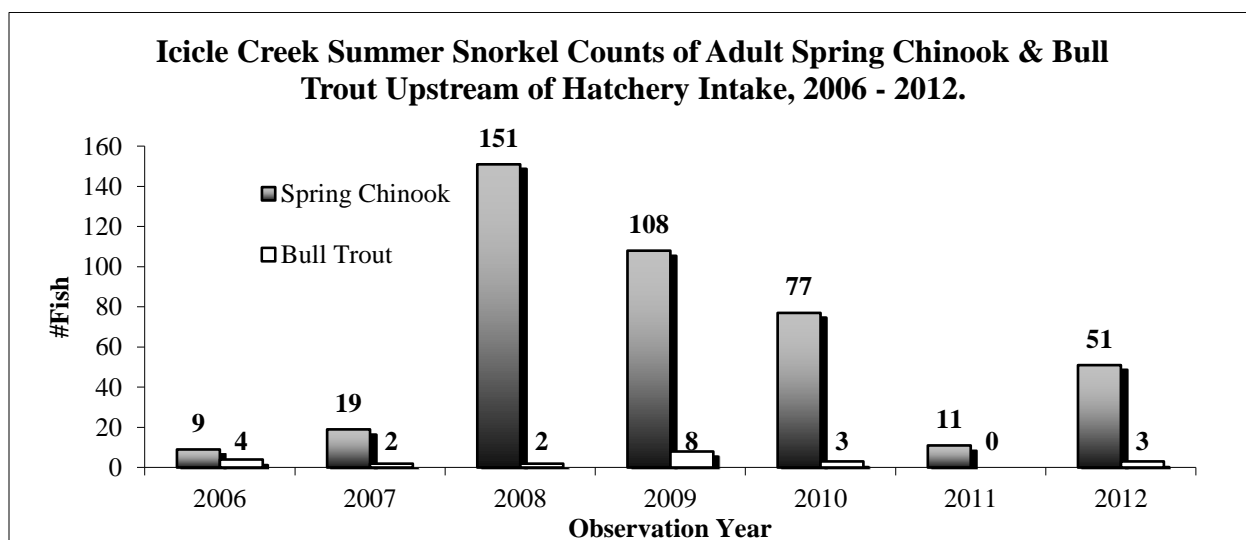


Figure 2. Icicle Creek snorkel survey counts above the Hatchery Intake, by year.

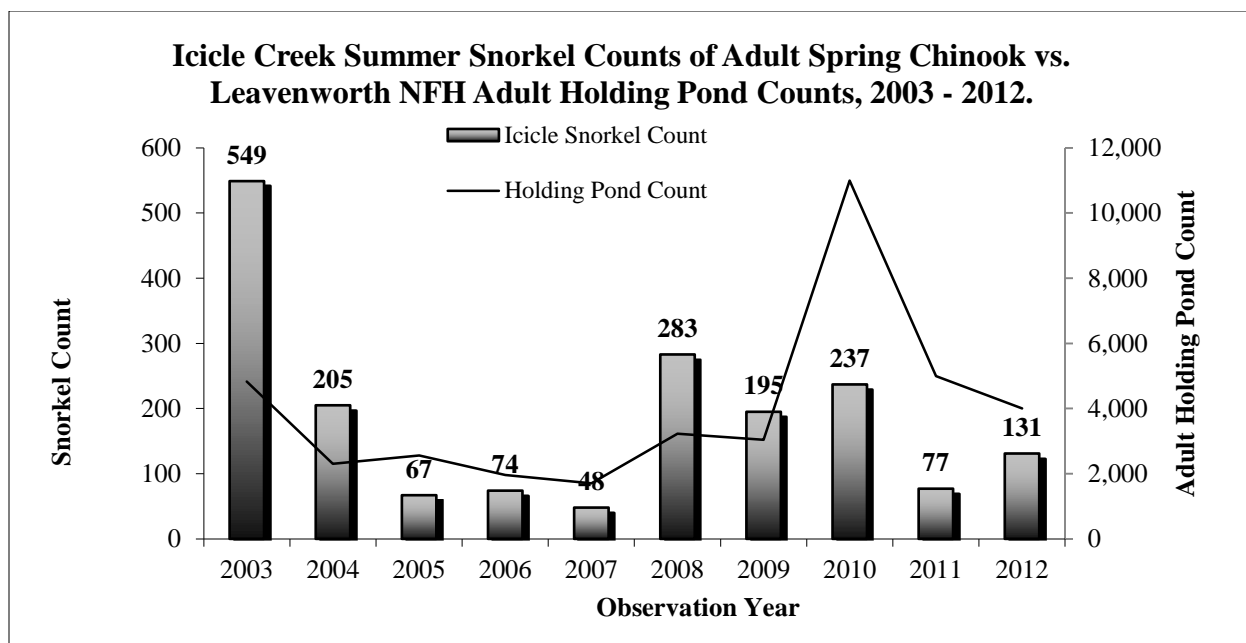


Figure 3. Icicle Creek snorkel counts vs. LNFH adult pond counts, by year.

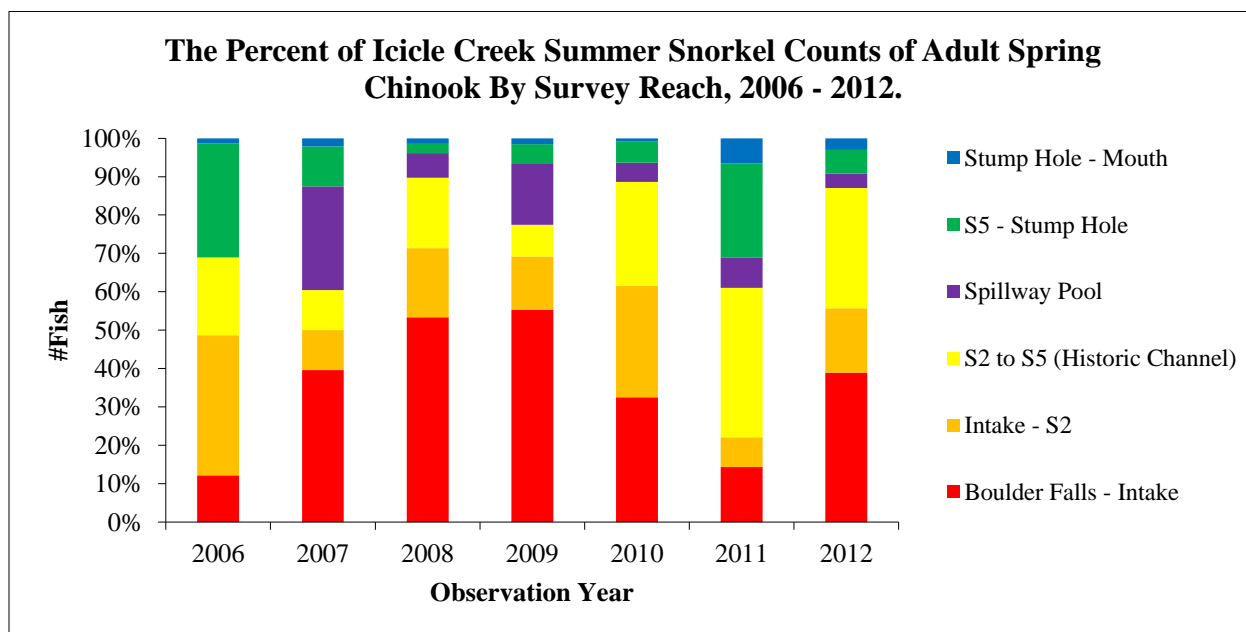


Figure 4. Spring Chinook distribution by reach and year.

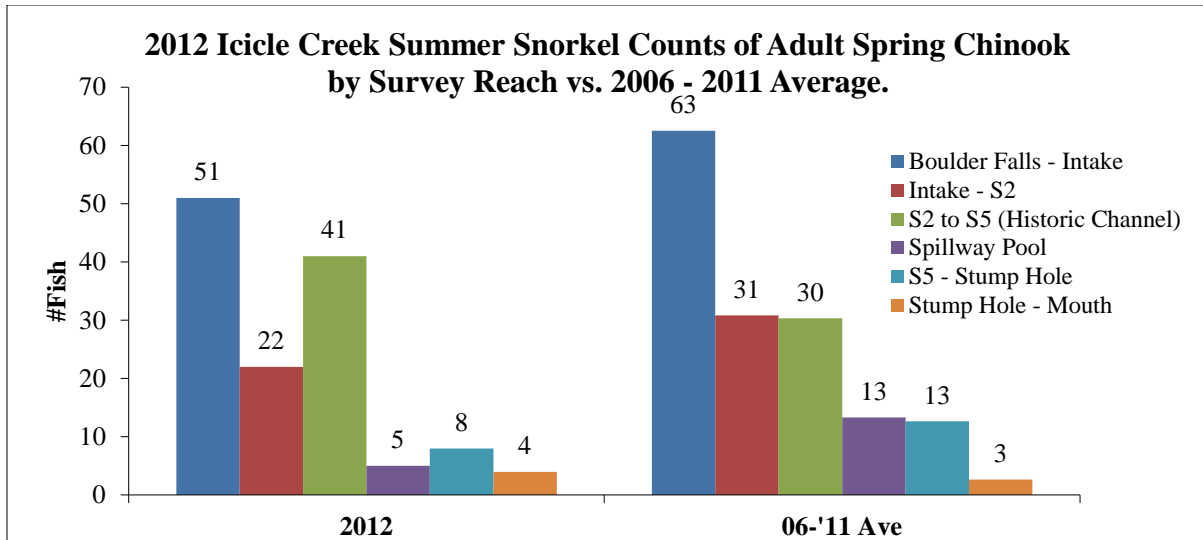


Figure 5. Spring Chinook counts, 2012 vs. average 2006-2011.

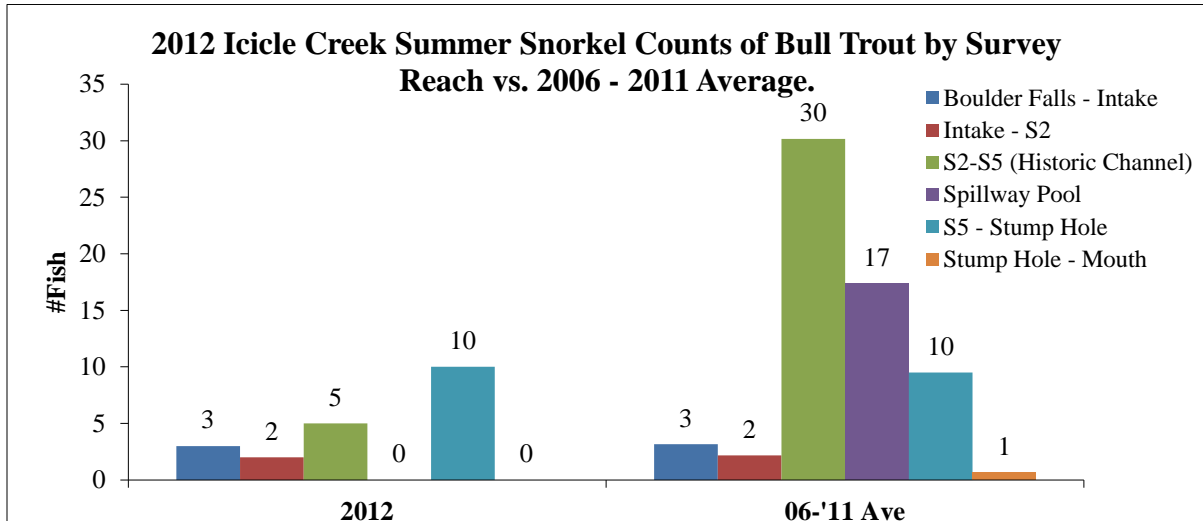


Figure 6. Bull Trout counts, 2012 vs. 2006-2011.

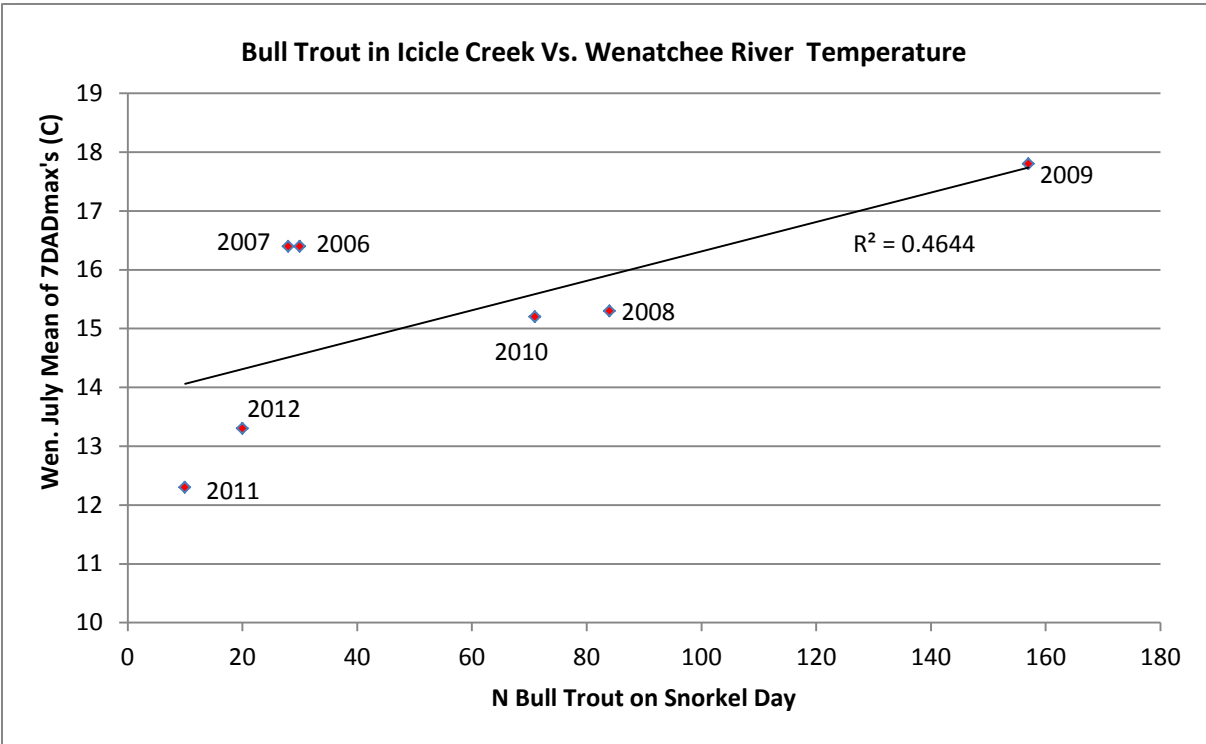


Figure 7. Bull Trout in Icicle Creek vs. Wenatchee River Temperature.